42390P11235

PATENT

REMARKS

Claims 1-16 of the application stand rejected. Claims 1-9 and 12-14 have been amended herein to more clearly define the scope of the presently claimed invention. Applicant respectfully requests reconsideration of pending Claims 1-16 in light of the amendments and remarks herein.

_35 U.S.C. §112_

Claims 1-16 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the Examiner submits that with respect to Claims 1, 8, 10, 12 and 15, it is not clearly indicated "how the second pointer can allow to cast the reference of an interface type into the references whose type is defied by the class configured to implement the interface."

First and foremost, prior to addressing the propriety of the rejection, Applicant respectfully points out that Claims 12 and 15 do not include the same limitation as Claims 1, 8 and 10. As a result, Applicant submits that the Examiner's rejection is not applicable to these claims and the claims dependent on these claims. With respect to independent Claims 1, 8 and 10, Applicant is at a loss to understand the Examiner's rationale for the rejection. As described in the specification, in embodiments of the invention, the internal data structure of objects which are instances of a class that implements interfaces may be modified to include extra fields, where the extra fields include pointers to interface vtables for the interfaces implemented by the class. These pointers may allow more efficient dispatch of interface functions and/or allow the efficient casting of references of an interface type into references whose type is defined by the class that implements the interface (Specification, Page 9, lines 11-18). The Specification then goes on to describe exactly how the features of the claimed invention are achieved.

Applicant respectfully submits that the information provided in the specification would more than adequately enable one of ordinary skill in the art to practice the invention of Claims 1, 8 and 10 (and all claims dependent on these claims). As such, Applicant is at a loss to understand the Examiner's suggestion (which has never previously been raised in multiple prior amendments) that this element of the claims is somehow unclear. Applicant therefore

6

42390P11235   PATENT

respectfully requests the Examiner to either withdraw this rejection or provide Applicant with additional basis to consider the Examiner's rejection. Merely making the statement that an element of the claim is not clearly indicated gives Applicant little to no guidance as to the Examiner's concern. Barring additional information, Applicant respectfully requests the Examiner to withdraw the rejection to Claims 1-16 under 35 U.S.C. §112, second paragaraph.

35 U.S.C. §101

Claims 1-9 and 12-14 stand rejected under 35 U.S.C. §101 because the Examiner suggests that the invention is directed to non-statutory subject matter. Specifically, the Examiner states that Claims 1-7 are non-statutory because they are "not tangibly embodied in a manner so as to be executable as the only hardware is in an intended use statement." Additionally, the Examiner suggests that Claims 8 and 12 are directed to method steps, which can be practiced mentally, in conjunction with pen and paper, thus rendering them unstatutory.

Applicants respectfully traverse the Examiner's rejection and submit that the language of the claims is directed to statutory subject matter as-is. In an effort to move forward with the substantive examination of the case, however, Applicants have amended these claims herein to include the phrase "computer-implemented", to further highlight the fact that these claims are directed to computer-implemented inventions. Applicant respectfully submits that the preamble of Claim 1 has additionally been amended to clarify that the system is not only a computer-implemented system, but also one directed to object oriented programming. Applicants therefore respectfully request the Examiner to withdraw the 35 U.S.C. §101 rejection to Claims 1-9 and 12-14.

35 U.S.C. §103

Claims 1, 8 and 10 stand rejected under 35 U.S.C. §103 as being unpatentable over U.S. Patent No. 5,754,862 ("Jones") in view of U.S. Patent No. 6,016,392 ("Jordan") in view of U.S. Patent No. 5,794,041 ("Law"). Claim 7 stands rejected under 35 U.S.C. §103 as being unpatentable over Jones in view of Law in view of Jordan. Claims 2, 3 and 4 stand rejected under 35 U.S.C. §103 as being unpatentable over Jones in view of Law in further view of AP ("Arrays, pointers, pointer arithmetic"). Claims 5 and 6 stand rejected under 35 U.S.C. §103 as being unpatentable over Jones in view of Law in further view of Kathleen Fisher, et al. ("What is

7

42390P11235 PATENT

an Object Oriented Programming Language?", hereafter "Kathleen"). Claims 9 and 11 stand rejected under 35 U.S.C. §103 as being unpatentable over Jones in view of Law in further view of Danel Liang ("Java Programming"). Claims 12, 15 and 16 stand rejected under 35 U.S.C. §103 as being unpatentable over TO ("Object Reference Casting") in view of Law. Claim 13 stands rejected under 35 U.S.C. §103 as being unpatentable over TO in view of Law in view of AP. And finally, Claim 14 stands rejected under 35 U.S.C. §103 as being unpatentable over TO in view of Law and in further view of U.S. Patent No. 6,421,681 B1 ("Gartner"). Applicant respectfully traverses all these rejections.

First, Applicant respectfully suggests that the Examiner erroneously cited Jordan in the rejection to Claims 1, 8 and 10. Although the Examiner states that the rejection is based on Jones, Jordan and Law, the Examiner's subsequent explanation relies solely on Jones and Law. As a result, Applicant herein addreses Jones and Law as the primary references used to render independent claims 1, 8 and 10 unpatentable.

With respect to independent Claims 1, 8 and 10, as described in the specification, in embodiments of the invention, the internal data structure of objects which are instances of a class that implements interfaces may be modified to include extra fields, where the extra fields include pointers to interface vtables for the interfaces implemented by the class. These pointers may allow more efficient dispatch of interface functions and/or allow the efficient casting of references of an interface type into references whose type is defined by the class that implements the interface (Specification, Page 9, lines 11- 18). The Examiner concedes that this limitation is not taught by either Jones, but suggests out that Boujarwah teaches this element and that it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Jones and Law. Applicant strongly disagrees.

Applicant respectfully submits that Law does not teach or suggest the use of pointers in this manner. The sections of Law highlighted by the Examiner:

"Virtual dispatch is efficiently implemented as an indirect function call through a table of function addresses, called a virtual function table or VFT. Conceptually, the compiler generates one or more VFTs for any class that defines or inherits a virtual function. If a class has at least one VFT, then any object of that class has a pointer to one of the class's VFTs, and this pointer provides the mechanism for accessing the VFT. This pointer is referred to as the VFT pointer.

Consider the static (or declared) type, S, and the dynamic (or run-time) type, D, of the object pointed to in p in the virtual function call, p.fwdarw..function.(). D may be S or a derived class of S, and a fully derived object of class D implies that the object's dynamic type is D. The actual function invoked at this call site is the function .function. that is inherited or overridden by D. Suppose this function is E::.function.(); that is, .function. is defined in class E. The following steps

8

PATENT

> may be necessary during virtual dispatch to E::.function.() at run-time, where the THIS pointer
> initially contains the address of the S subobject in the D object:
>> 1. Adjust the THIS pointer to the subobject, X, in the D object whose VFT contains the
>> entry that has the address of E::.function.(). Such a THIS adjustment is called an early cast.
>> 2. Access the VFT entry."

Law, Col. 4, line 49 – Col. 5, line 6.

The Examiner states that theses section of Law teach or suggest the claimed element, but Applicant fails to follow the Examiner's rationale. For example, Law mentions a pointer there is no mention in Law of a second pointer configured to point to the interface vtable associated with the interface. The section highlighted by the Examiner above merely makes mention of "an object *comprising* a second pointer configured to point to the interface vtable associated with the interface", but rather merely the fact that a pointer may exist that may point to a virtual function table. To further clarify that Claims 1, 8 and 10 are directed to a scheme whereby objects may include an extra field to contain the pointer, Applicant respectfully invites the Examiner to review the amended claims. As amended, Applicant respectfully submits that the combination of Jones and Law does not tech or suggest each element of the claimed invention. Jones and Law therefore do not render independent Claims 1, 8 and 10 unpatentable and Applicant respectfully requests the Examiner to withdraw the rejection to these claims.

Claims 2-6 are dependant on independent Claim 1, Claim 9 is dependant on Claim 8 and Claim 11 is dependant on Claim 10. As previously described, Jones, alone or in combination with Law, does not render independent Claims 1, 8 and 10 unpatentable. The addition of AP, Kathleen and/or Java Programming to Jones and/or Jordan also does not teach or suggest the elements of Claims 1, 8 and/or 10, and therefore these references also do not render the dependant Claims 2-6, 9 and 11 unpatentable. Applicant respectfully requests the Examiner to withdraw the rejections to these claims.

With respect to independent Claim 12, the Examiner concedes that TO does not explicitly teach the element of "the pointer contained in the object, the pointer configured to point to a canonical base address of the object, the pointer allowing for efficient casting of the first reference', but suggests that Law teaches this element. Applicant strongly disagrees. Again, the Examiner highlights the same section of Law described above, namely Col. 4, line 49-Col. 5, line 6. The Examiner makes no showing that Law in fact teaches pointing to a canonical base address, but rather simply reiterates that Law describes use of a pointer to a VFT. Applicant

9

42390P11235 PATENT

respectfully submits that this fails to rise to the level of showing how Law teaches this element. As such, Applicant respectfully submits that Claim 12, and claims dependent on Claim 12 (i.e., Claims 13 and 14) are patentable over the combination of TO and Law and respectfully request the Examiner to withdraw the rejections to these claims.

With respect to Claims 15 and 16, the Examiner submits that the same arguments for Claims 12 and 13 apply. Applicants therefore respectfully submit that as explained above, the Examiner has failed to show how TO in combination with Law render each and every element of these claims unpatentable. Applicant submits that the Examiner's statements are conclusary at best and are insufficient to present a prima facie case of unpatentability. Thus, Applicant respectfully requests the Examiner to withdraw the rejection to these claims.

In summary, Applicant respectfully submits that none of the references cited, alone and/or in combination, render Claims 1-16 unpatentable. Applicant therefore respectfully requests the Examiner to withdraw the rejection to Claims 1-16 under 35 U.S.C. §103.
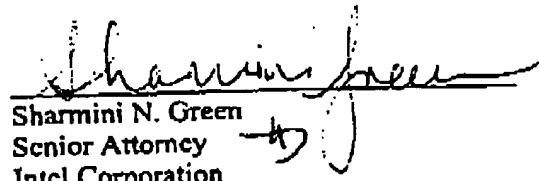
10

42390P11235

CONCLUSION

Based on the foregoing, Applicant respectfully submits that the applicable objections and rejections have been overcome and that pending Claims 1-16 are in condition for allowance. Applicant therefore respectfully requests an early issuance of a Notice of Allowance in this case. If the Examiner has any questions, the Examiner is invited to contact the undersigned at (714) 669-1261.

Respectfully submitted,

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11